WHAT IS CLAIMED IS:

1. An active anti-vibration apparatus comprising:

an anti-vibration table;

a movable portion mounted on said anti-vibration table;

a pneumatic spring for supporting and driving said anti-vibration table;

a servo valve for adjusting a pressure of said pneumatic spring;

an electromagnetic actuator for applying a force to said anti-vibration table;

a displacement sensor for detecting displacement of said anti-vibration table;

an anti-vibration table displacement controller for generating a driving signal for said servo valve on the basis of an output from said displacement sensor so that said anti-vibration table keeps a predetermined posture at a predetermined position; and

an anti-vibration table vibration controller for generating a driving signal for said electromagnetic actuator,

wherein both said servo valve and said electromagnetic actuator are so controlled as to compensate for movement of a load that occurs when said movable portion moves on said anti-vibration table.

2. The apparatus according to claim 1, wherein said movable portion is a stage mounted on said anti-vibration

table, and

the apparatus further comprises

driving means for driving said stage,

a position sensor for detecting a position of said stage, and

a stage position controller for controlling the position of said stage on the basis of an output from said position sensor so as to coincide with a predetermined target position.

3. The apparatus according to claim 1, wherein said electromagnetic actuator applies to said anti-vibration table a force in at least one of the same direction as a support direction of said pneumatic spring and a direction perpendicular to said same direction.

4. The apparatus according to claim 1, further comprising an acceleration sensor for detecting an acceleration of said anti-vibration table,

wherein said anti-vibration table displacement controller generates the driving signal for said servo valve on the basis of an output from said displacement sensor and/or said acceleration sensor, so that said anti-vibration table keeps the predetermined posture at the predetermined position.

5. The apparatus according to claim 1, wherein at least one of a target position and a target speed of said movable portion is feed-forwarded to said anti-vibration table displacement controller and said anti-vibration table

vibration controller.

6. The apparatus according to claim 1, wherein a signal that filters at least one of a target position and a target speed of said movable portion is feed-forwarded to said anti-vibration table displacement controller and said anti-vibration table vibration controller.

7. The apparatus according to claim 6, wherein

the filter includes first and second high-pass filters, and

a signal obtained by passing the target speed of said movable portion through the first high-pass filter and a signal obtained by passing the target position of the movable portion through the second high-pass filter are feed-forwarded to said anti-vibration table displacement controller and said anti-vibration table vibration controller, respectively.

8. The apparatus according to claim 6, wherein

the filter includes low- and high-pass filters, and

a signal obtained by passing the target speed of said movable portion through the low-pass filter and a signal obtained by passing the target position of the movable portion through the high-pass filter are feed-forwarded to said anti-vibration table displacement controller and said anti-vibration table vibration controller, respectively.

9. The apparatus according to claim 6, wherein

the filter includes first and second low-pass filters, and

a signal obtained by passing the target speed of said movable portion through the first low-pass filter and a signal obtained by passing the target position of the movable portion through the second low-pass filter are feed-forwarded to said anti-vibration table displacement controller and said anti-vibration table vibration controller, respectively.

10. The apparatus according to claim 6, wherein the filter includes a low-pass filter, and a signal obtained by passing the target speed of said movable portion through the low-pass filter is feed-forwarded to both said anti-vibration table displacement controller and said anti-vibration table vibration controller.

11. The apparatus according to claim 7, wherein cutoff frequencies of both of said first and second high-pass filters are substantially equal, and each of the respective cutoff frequencies has a predetermined value in a controllable frequency range of said pneumatic spring.

12. The apparatus according to claim 8, wherein cutoff frequencies of both of said low- and high-pass filters are substantially equal, and each of the respective cutoff frequencies is a predetermined value in a controllable frequency range of said pneumatic spring.

13. The apparatus according to claim 9, wherein cutoff frequencies of both of said first and second low-pass filters are substantially equal, and each of the respective

cutoff frequencies is a predetermined value in a controllable frequency range of said pneumatic spring.

14. An exposure apparatus comprising:

a projection optical system for projecting a pattern onto a substrate;

a stage for holding the substrate; and

an active anti-vibration apparatus with an anti-vibration table mounted under said stage, said active anti-vibration apparatus comprising

a movable portion mounted on said anti-vibration table,

a pneumatic spring for supporting and driving said anti-vibration table,

a servo valve for adjusting a pressure of said pneumatic spring,

an electromagnetic actuator for applying a force to said anti-vibration table,

a displacement sensor for detecting displacement of said anti-vibration table,

an anti-vibration table displacement controller for generating a driving signal for said servo valve on the basis of an output from said displacement sensor so that said anti-vibration table keeps a predetermined posture at a predetermined position, and

an anti-vibration table vibration controller for generating a driving signal for said electromagnetic actuator,

wherein both said servo valve and said electromagnetic actuator are so controlled as to compensate for movement of a load that occurs when said movable portion moves on said anti-vibration table.

15. A device manufacturing method comprising the steps of:

applying a resist on a substrate;

drawing a pattern on the substrate with an exposure apparatus having an active anti-vibration apparatus, and

developing the substrate,

the active anti-vibration apparatus comprising

an anti-vibration table,

a movable portion mounted on said anti-vibration table,

a pneumatic spring for supporting and driving said anti-vibration table,

a servo valve for adjusting a pressure of said pneumatic spring,

an electromagnetic actuator for applying a force to said anti-vibration table,

a displacement sensor for detecting displacement of said anti-vibration table,

an anti-vibration table displacement controller for generating a driving signal for said servo valve on the basis of an output from said displacement sensor so that said anti-vibration table keeps a predetermined posture at a predetermined position, and

an anti-vibration table vibration controller for generating a driving signal for said electromagnetic actuator,

wherein both said servo valve and said electromagnetic actuator are so controlled as to compensate for movement of a load that occurs when said movable portion moves on said anti-vibration table.